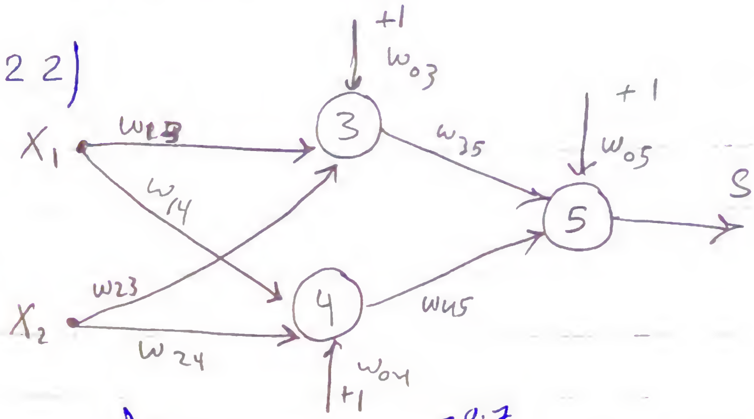
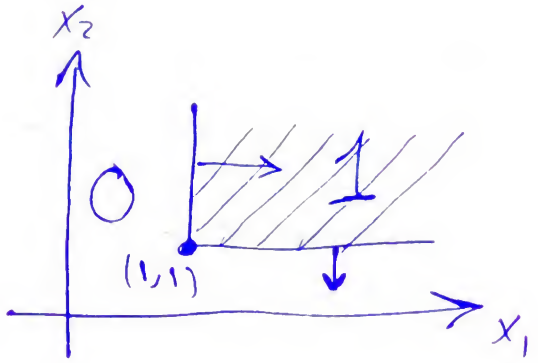
26/11/2016 السبت م. محمد عبدالله [7] سكشن

2 2)





* Keep $w_{03} = -0.7$, $w_{04} = +0.4$
* Use binary threshold.
* Classify (0,0) ; (0,3) ; (2,2) ; (2,-2)

equations:-

$x_1 = 1$; $x_2 = 1$

$\Rightarrow x_1 - 1 = 0$; $-x_2 + 1 = 0$ (Take care of orientation)

for N3

$y_3 = w_{13} x_1 + w_{23} X_2 + w_{03}$

we have $x_1 - 1 = 0 \ * \ 0.7$

$\Rightarrow 0.7 x_1 - 0.7 = 0$

$\Rightarrow w_{03} = -0.7$; $w_{13} = 0.7$; $w_{23} = 0$

for N4

$y_4 = w_{14} x_1 + w_{24} x_2 + w_{04}$

we have $-x_2 + 1 = 0 \ * \ 0.4$

$\Rightarrow -0.4 x_2 + 0.4 = 0$

$\Rightarrow w_{04} = 0.4$; $w_{14} = 0$; $w_{24} = -0.4$

Design of the output

N5

$y_5 = w_{35} f(y_3) + w_{45} f(y_4) + w_{05}$

-at $f(y_3) = f(y_4) = 0$

$y_5 = w_{05} < 0$

f(3)	f(4)	S
0	0	0
0	1	0
1	0	1
1	1	0

* at $f(y_3) = 1$, $f(y_4) = 0$

$y_5 = w_{35} + w_{05} > 0$ $\quad s = 1$

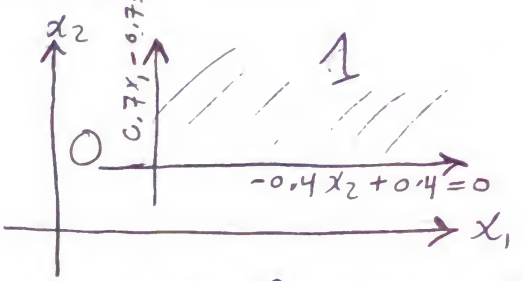
* at $f(y_3) = 0$; $f(y_4) = 1$

$y_5 = w_{45} + w_{05} < 0$

* at $f(y_3) = f(y_4) = 1$

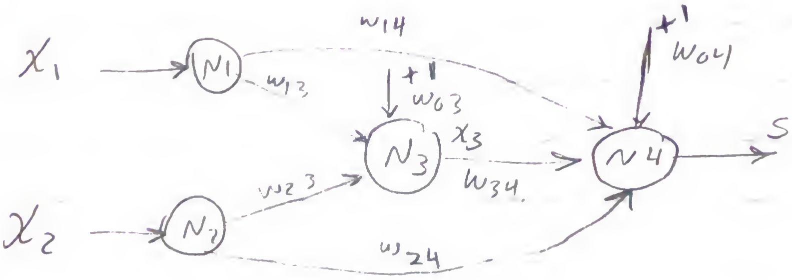
$y_5 = w_{35} + w_{45} + w_{05} < 0$

* Choose $w_{05} = -0.5$
  $w_{35} = 1$ $\Rightarrow$ problem Solved
  $w_{45} = -1$



(x_1, x_2)	y_3	$f(y_3)$	y_4	$f(y_4)$	y_5	$f(y_5)$	C_0/C_1
(0, 0)	$-0.7 < 0$	0	$0.4 > 0$	1	$-1.5 < 0$	0	C_0
(0, 3)		"	"	"	"	"	"
(2, 2)	"	"	"	"	"	"	"
(2, -2)	"	"	"	"	"	"	"

29) XNOR using 1 Less neuron (3D Trick)



Design for XNOR

* assume $x_3 = x_1 x_2$

x_1	x_2	S
0	0	1
0	1	0
1	0	0
1	1	1

$y_3 = w_{13} x_1 + w_{23} x_2 + w_{03}$

من مسائل سابقة ، نحقق AND

$w_{03} = -1$; $w_{13} = 0.6$; $w_{23} = 0.6$

*في الامتحان حل خطوة خطوة

OR $w_{03} = -1.5$; $w_{13} = w_{23} = 1$

$y_4 = x_1 w_{14} + x_2 w_{24} + x_3 w_{34} + w_{04}$

* at (0, 0, 0) $S = 1$

$y_4 = w_{04} > 0$ $(S = 1)$

* at (0, 1, 0) $(S = 0)$

$y_4 = w_{24} + w_{04} < 0$

* at (1, 0, 0) $(S = 0)$

$y_4 = w_{14} + w_{04} < 0$

* at (1, 1, 1) $(S = 1)$

$y_4 = w_{14} + w_{24} + w_{34} + w_{04} > 0$

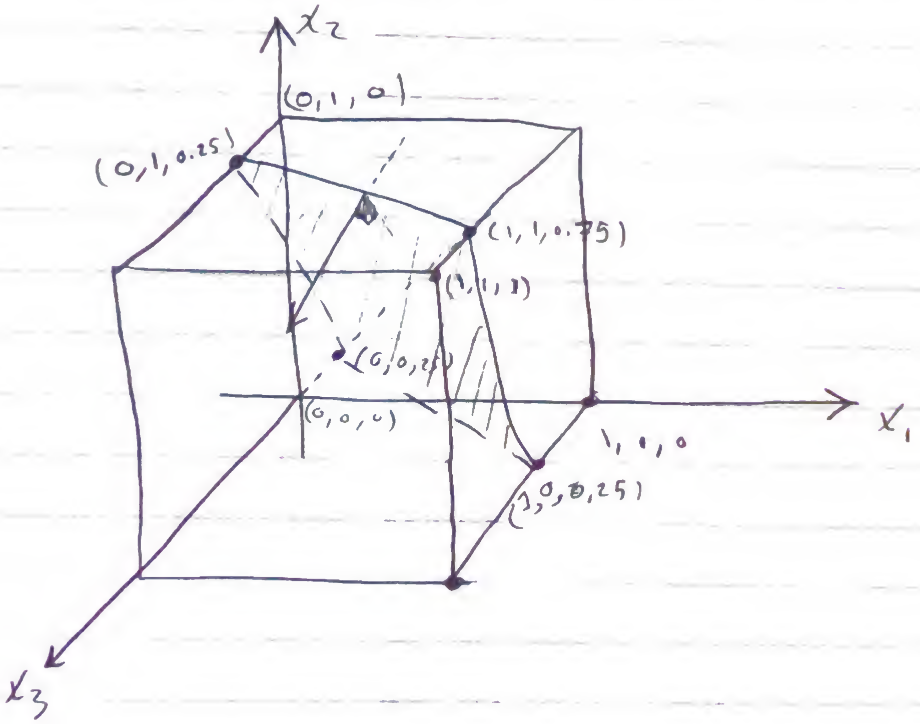
Choose $w_{04} = 0.5$

$w_{14} = -1$

$w_{24} = -1$

$w_{34} = 2$

$y_4 = -x_1 - x_2 + 2x_3 + 0.5 = 0$



مسألة التي بعدها مسألة الثلث ، شوفها من المحاضرة